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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Confirmation No. 7595	Art Unit: 3683
Examiner	

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Submission of Priority Document

Dear Sir:

Applicants hereby submit a certified copy of the priority document,
Swedish Application No. 0100203-9, to perfect Applicants' claim of priority.

Respectfully submitted,

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Intyg Certificate

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This is to certify that the annexed is a true copy of the documents as originally filed with the Patent- and Registration Office in connection with the following patent application.



(71) Sökande *Haldex Brake Products AB, Landskrona SE*
Applicant (s)

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För Patent- och registreringsverket
For the Patent- and Registration Office

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Avgift
Fee *170:-*

APPLICANT: HALDEX BRAKE PRODUCTS AB
TITLE: MODULAR DISC BRAKE

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Technical Field

The present invention concerns a modular disc brake. The disc brake is primarily intended for a vehicle, preferably a heavy road vehicle.

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Background of the Invention

The present invention is developed for use with different types of disc brakes. Thus, the invention is applicable for disc brakes having fixed caliper as well as disc brakes having sliding (floating) caliper. Traditionally the caliper of the disc brake is made in one piece and the brake mechanism is received in the caliper. This known design for a disc brake has both advantages and disadvantages. One disadvantage is that for maintenance, repair and/or exchange of parts of the brake mechanism normally all of the brake mechanism has to be taken out of the caliper. Furthermore, it is cumbersome to machine the caliper. Thus, there is a need for a disc brake which is more easy both to produce and to repair and maintain.

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The Invention

According to the present invention, a modular unit is replacing the traditional caliper. Said modular unit comprises a frame, a house and a cover. The machining of the frame is facilitated compared to the prior art where the frame, house and cover normally forms one single unit, i.e. the caliper.

The frame is of a fixed type or a sliding type. In the latter case it can be sliding on two or more slide pins. If there are more than two slide pins at least one of the slide pins is placed on the outboard side of the brake

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disc. The frame does not have to be disassembled for a possible change of mechanism.

One object of the present invention is to have a disc brake which is easy to produce and service.

5 A further object is to have a disc brake of reduced weight as compared to the prior art.

These objects are met by a modular disc brake having a brake mechanism and modules in form of a frame, a house and a cover.

10 Further objects and advantages will be obvious for a person skilled in the art when reading the detailed description below of a preferred embodiment.

Brief Description of the Drawings

15 The invention will be described further below by way of an example and with reference to the drawings below. In the drawings:

Fig. 1 is a perspective view of a disc brake according to the invention;

20 Fig 2 is an exploded view of the disc brake of Fig. 1; and

Fig. 3 is a cross section view taken along the line III-III of Fig. 1.

Detailed Description of a Preferred Embodiment

25 The disc brake of the invention is formed of a number of modules. In the shown example the modules are a frame 1, a house 2 and a cover 3. The brake mechanism 7 of the disc brake is a pre-mounted, single unit. In other embodiments
30 (not shown) the brake mechanism does not form an own pre-mounted unit, but is pre-mounted in the house 2 or cover 3. The modules are kept together by a number of pull rods 4 and nuts 5.

35 The frame 1 has a recess 10 for receiving the lower part of the house 2. Thrust units of the brake mechanism 7

project through the bottom of the house 2 and through openings 11 at the bottom of the recess 10 of the frame 1 after assemble. The thrust units of the brake mechanism 7 are fixed to a thrust plate 8. The thrust plate 8 is
5 received in a thorough opening 12 of the frame 1. In said thorough opening 12 of the frame 1 the brake disc (not shown) is also received. In the shown embodiment the frame 1 has four openings 9 for receiving sliding pins (not shown). A person skilled in the art realizes that the
10 number of slide pins, and thus openings for the slide pins, may vary, normally from two and upwards. When the disc brake is activated the thrust plate 8 will in normal way press a brake pad (not shown) against the brake disc. At the same time the frame 1 will slide towards the brake disc
15 on sliding pins received in the openings 9, in which sliding a brake pad (not shown) will be pressed against the opposite side of the brake disc. This is the normal function for a disc brake having a floating caliper. For brakes having a fixed frame 1 (caliper) there are no
20 sliding pins.

The machining of the frame 1 is made more simple compared to traditional brakes, where the frame 1, house 2 and cover 3 normally are integrated parts of one single unit, i.e. the caliper. Multiple sliding pins give a more
25 stable construction than using two sliding pins, which is common within the state of the art.

The house 2 will receive the brake mechanism 7 when the disc brake is assembled. In the bottom of the housing 2 there are two thorough openings for the thrust units as
30 indicated above. Furthermore, the house 2 is furnished with a space for receiving the lever of the brake mechanism 7. In other embodiments (not shown) the brake mechanism has only one thrust unit, in which case the house 2 will only have one opening in the bottom.

The function of the house 2 is to protect against dirt and moisture. The house 2 will not take up any load and thus it may be made of material having low weight, such as plastic or metal, which is of advantage regarding the total weight of the disc brake.

The brake mechanism 7, which may have one or more thrust units, may be pre-mounted in the cover 3 or the house 2 or may alternatively be pre-mounted as a separate unit. The brake mechanism as such, does not form any part of the present invention and will thus not be described further here. A person skilled in the art realizes that the brake mechanism may have many different designs without departing from the present invention.

Finally a cover 3 is provided to cover the opening of the house 2. The cover 3 is provided with a number of openings 14, to receive pull rods 4. Each pull rod 4 has a head 16 at one end and is threaded at the other end to receive nuts 5. Even though the pull rods 4 are shown with the heads 16 at the frame 1 and the threaded ends at the cover 3, a person skilled in the art realizes that the pull rods 4 may be inserted the other way around. Thus, the pull rods 4 may have the heads 16 at the cover 3. The pull rods 4 have a predetermined length. The length of the pull rods 4 is somewhat longer than the length of the house 2. The predetermined length is adapted to the wish to attain flexible pretension for the system of house 2, gasket 6, cover 3 and frame 1. In the shown embodiment there are six pull rods, but a person skilled in the art realizes that any number of pull rods 4 may be used as long as a sufficient fixation is established.

In order to enable pre-tension of the pull rods 4 and accurate distance between the cover 3 and the frame 1, the pull rods 4 may be surrounded by spacing sleeves.

The cover 3 has further openings for the ends of the thrust units, which is needed for adjustment of the

position of the brake pads in relation to the brake disc. Furthermore a gasket 6 is received and held between the house 2 and the cover 3.

When the disc brake is assembled the brake mechanism 5 7 is brought down into the house 2. The house 2 is then brought into the recess 10 of the frame 1. When the house 2 is brought into the frame 1, the thrust units will go through the openings 11 at the bottom of the recess 10. The thrust plate 8 is then fixed to the brake mechanism 7 by 10 means of the thrust units. Thereafter the pull rods 4 are inserted in pull rod openings 13 of the frame 1 and pull rod openings 14 of the cover 3 is placed on the pull rods 4. At least the ends of the pull rods 4 closest to the cover 3, when the disc brake has been assembled, are 15 furnished with threads. Nuts 5 are screwed onto the pull rods 4 to assemble the disc brake. A gasket 6 is normally placed between the house 2 and cover 3 before the disc brake is assembled.

The different parts of the disc brake of the 20 invention are adapted to each other regarding actual form and other design considerations.



CLAIMS

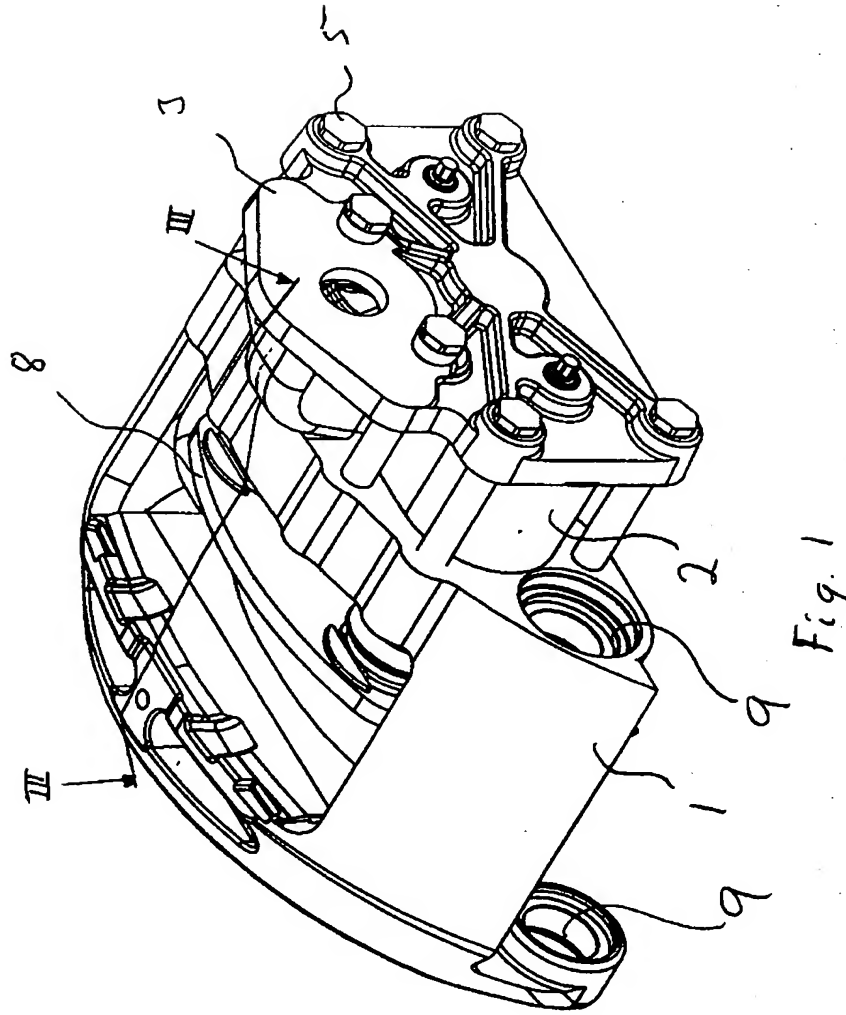
1. A modular disc brake **characterized** in that it comprises a brake mechanism (7) and modules in form of a frame (1), a house (2) and a cover (3).
- 5 2. The disc brake of claim 1, **characterized** in that the frame (1) has a recess to receive the house (2).
3. The disc brake of claim 1 or 2, **characterized** in that the brake mechanism (7) is a single pre-mounted unit received in the house (2).
- 10 4. The disc brake of claim 1 or 2, **characterized** in that the brake mechanism (7) is pre-mounted in the house (2) or cover (3).
5. The disc brake of any of the previous claims, **characterized** in that the cover (3) is attached in such a
15 way that it covers the end of the house (2).
6. The disc brake of any of the previous claims, **characterized** in that the house (2) is open in one direction to receive the brake mechanism (7); that it has one or more openings for connection of one or more thrust
20 units of the brake mechanism (7) with one or more thrust plates (8); and that it has a space for receiving a lever of the brake mechanism (7).
7. The disc brake of any of the previous claims, **characterized** in that the frame (1) and cover (3) has
25 openings (13, 14) to receive a number of pull rods (4), which pull rods (4) are clamped between the frame (1) and the cover (3) in that nuts (5) are received on one end of each pull rod (4) and that the pull rods (4) have a head at the other end.
- 30 8. The disc brake of any of the previous claims, **characterized** in that a gasket (6) is received between the house (2) and the cover (3).
9. The disc brake of any of the previous claims, **characterized** in that the house (2) is pre-tensioned by
35 means of the pull rods (4).

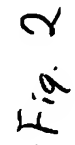
ABSTRACT

The present invention concerns a modular disc brake, preferably for a heavy road vehicle. The modular disc brake
5 comprises a frame (1), a house (2) and a cover (3). A brake mechanism (7) forming a single pre-mounted unit is received in the house (2). The modules are held together by means of pull rods (4) and nuts (5). The house (2) is received in a recess (10) of the frame (1). The cover (3) covers the end
10 of the house (2). The frame (1) is of a floating type having openings (9) to receive sliding pins.

To be published with Fig. 1.







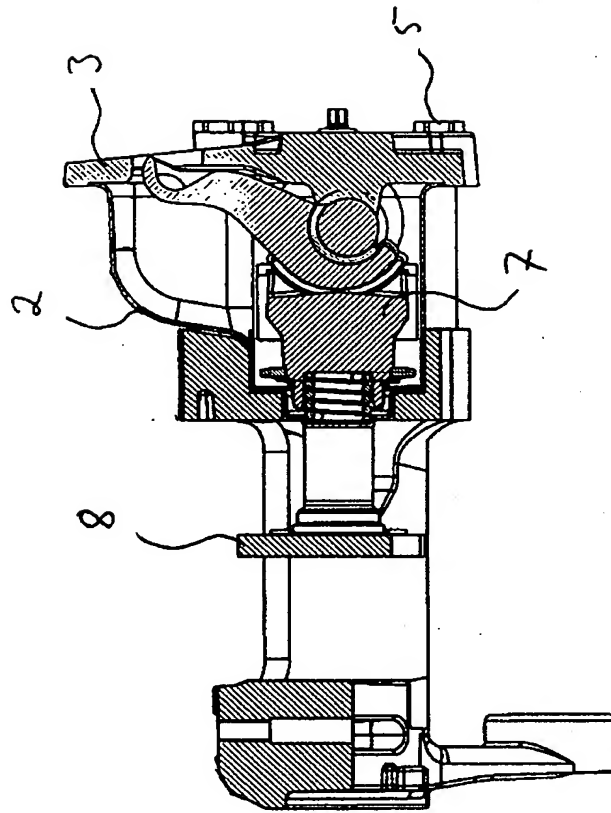


Fig. 3